WHAT IS CLAIMED IS:

1. A method of making a battery grade zinc powder, said method comprising:

(a) providing a molten zinc metal or a molten zinc alloy;

(b) subjecting said molten zinc metal or molten zinc alloy to impulse atomisation to produce a powder made up of solid particles of zinc metal or zinc alloy in the form of a battery grade zinc powder; and

(c) recovering said battery grade zinc powder.

2. The method of claim 1 wherein in step (b) the impulse atomisation has a frequency of between 20 and 1000Hz, a force applied to the plunger of between about 44.5 and 40 newtons, a plunger distance of between 1 to 7 mm and atomising apertures of between 40 and 500µm.

3. The method of claim 2 wherein in step (b) said particles are cooled in an atmosphere comprising a gas selected from the group consisting of air, inert gas, oxygen and a mixture of 0 to 20% oxygen with the remainder being inert gas.

4. The method of claim 3 wherein said inert gas is selected from the group consisting of nitrogen, helium, argon and any mix of nitrogen, helium and argon.

5. A battery-grade zinc powder comprising zinc metal or zinc alloy particles, said zinc metal or zinc alloy particles having a particle size distribution where the log normal slope of the not classified material is less than 2.

6. The battery-grade zinc powder of claim 5 wherein a major portion of said particles are teardrop.

7. The battery grade zinc powder of claim 6 wherein said particles have an average length between about 250µm and 3000µm, preferably between 500µm and 2000µm.

8. The battery-grade zinc powder of claim 6 wherein said particles have an

aspect ratio between 2 and 30, preferably between 8 and 22.

9. The battery-grade zinc powder of claim 5 wherein a major portion of said particles are acicular or stranded.

10. The battery grade zinc powder of claim 9 wherein said particles have an average length between about 250μm and 3000μm, preferably between 500μm and 2000μm.

11. The battery-grade zinc powder of claim 9 wherein said particles have an aspect ratio between 2 and 30, preferably between 8 and 22.

12. The battery-grade zinc powder of claim 5 wherein a major portion of said particles are spherical.

13. The battery grade zinc powder of claim 5 wherein said particles have an average width between about 40μm and 1000μm, preferably between 40μm and 200μm.

14. The battery grade zinc powder of claim 5 further comprising a second zinc metal or zinc alloy powder having different average characteristics in term of aspect ratio, width and length.

15. The battery grade zinc powder of claim 5 further comprising up to about 50% of a fine zinc metal or zinc alloy powder having a particle size of less than about 75μm.

16. The battery grade zinc powder of claim 15 wherein said fine zinc metal or zinc alloy powder is fabricated from the same zinc metal or zinc alloy as said zinc particles.

17. The battery grade zinc powder of claim 15 comprising up to about 20% of said fine zinc metal or zinc alloy powder.

18. The battery grade zinc powder of claim 5 further comprising up to about 50% of a second zinc metal or zinc alloy powder having an average aspect ratio of about 2 and a particle size distribution between about 54μm and about 425μm.

19. The battery grade zinc powder as in claim 18 wherein said second zinc powder is fabricated from the same zinc metal or zinc alloy as said zinc particles.

20. The battery grade zinc powder as in claim 18 comprising up to about 20% of said second zinc powder.

21. The battery grade zinc powder of claim 5 wherein the zinc powder is a zinc alloy comprising zinc, bismuth and indium.

22. The battery grade zinc powder of claim 21 wherein said zinc alloy comprises between about 50 to 1000 ppm, preferably between about 100 to 500 ppm, bismuth.

23. The battery grade zinc powder of claim 21 wherein said zinc alloy comprises between about 50 to 1000 ppm indium, preferably between about 100 to 500 ppm, indium.

24. The battery grade zinc powder of claim 21 wherein said zinc alloy further comprises aluminum.

25. The battery grade zinc powder of claim 24 wherein said zinc alloy further comprises calcium.

26. The battery grade zinc powder of claim 25 wherein said zinc alloy comprises between about 20 to 1000ppm calcium, preferably between about 50 to 200ppm, calcium.

27. The battery grade zinc powder of claim 24 wherein said zinc alloy further

comprises lead.

28. The battery grade zinc powder of claim 27 wherein said zinc alloy comprises between 50 to 1000ppm lead, preferably between about 50 to 500ppm, lead.

29. The battery grade zinc powder of claim 24 wherein said zinc alloy comprises between about 20 to 1000ppm aluminum, preferably between about 50 to 200ppm, aluminum.

30. The battery grade zinc powder of claim 21 wherein said zinc alloy further comprises calcium.

31. The battery grade zinc powder of claim 30 wherein said zinc alloy comprises between about 20 to 1000ppm calcium, preferably between about 50 to 200ppm, calcium.

32. The battery grade zinc powder of claim 30 wherein said zinc alloy further comprises lead.

33. The battery grade zinc powder of claim 32 wherein said zinc alloy comprises between 50 to 1000ppm lead, preferably between about 50 to 500ppm, lead.

34. The battery grade zinc powder of claim 21 wherein said zinc alloy further comprises lead.

35. The battery grade zinc powder of claim 34 wherein said zinc alloy comprises between 50 to 1000ppm lead, preferably between about 50 to 500ppm, lead.

36. The battery grade zinc powder of claim 5 wherein said particles are fabricated using impulse atomisation.

37. The battery grade zinc powder of claim 36 wherein said impulse atomisation has a frequency of between 20 and 1000Hz, a force applied to the plunger of between about 44.5 and 400 newtons, a plunger distance of between 1 to 7 mm and atomising apertures of between 40 and 500µm.

38. The battery grade zinc powder of claim 37 wherein said particles are cooled in an atmosphere comprising a gas selected from the group consisting of air, inert gas, oxygen and a mixture of 0 to 20% oxygen with the remainder being inert gas.

39. The battery grade zinc powder of claim 38 wherein said inert gas is selected from the group consisting of nitrogen, helium, argon and any mix of nitrogen, helium and argon.

40. An anode for an electrochemical cell comprising the battery grade zinc powder of claim 5, the zinc powder being suspended in a fluid medium.

41. The anode of claim 40 wherein said fluid medium is a gelled KOH electrolyte.

42. The anode of claim 41 wherein said gelled KOH electrolyte comprises i) 98% by weight of KOH 40%/ZnO 3% and ii) 2% by weight of a gelling agent.

43. The battery grade zinc powder of claim 42 wherein said gelling agent is polyacrylic acid.

44. An electrochemical cell comprising a cathode, an anode comprising the battery grade zinc powder of claim 5 and a separator electrically separating said cathode from said anode.

45. The electrochemical cell of claim 44 wherein said separator is fabricated from a material selected from the group consisting of rayon or cellulose.

46. The electrochemical cell of claim 45 wherein said cathode comprises manganese dioxide, wherein said fluid medium is a gelled KOH electrolyte and further comprising a current collector inserted into said anode.

47. The electrochemical cell of claim 46 wherein said gelled KOH electrolyte comprises about 2% by weight of a gelling agent.

48. The electrochemical cell of claim 47 wherein said gelling agent is a polyacrylic acid.

49. A battery grade zinc powder comprising stranded particles fabricated from a zinc metal, said stranded particles having a tap density of at most about 3.2 g/cc, preferably at most about 2.8 g/cc

50. A battery grade zinc powder comprising tear drop particles fabricated from a zinc metal, said tear drop particles having a tap density of at most about 3.6 g/cc.

51. A battery grade zinc powder comprising spherical particles fabricated from a zinc metal, said spherical particles having a tap density of at least about 4.10 g/cc.

52. A battery grade zinc powder comprising particles fabricated from a zinc alloy, said alloy consisting essentially of zinc, aluminum, bismuth and indium, said particles having a surface oxidation of less than about 0.10 %, preferably less than 0.06%.

53. A battery grade zinc powder comprising particles fabricated from a zinc alloy, said alloy consisting essentially of zinc, bismuth and indium, said particles having a surface oxidation of less than about 0.20 %.

54. A battery grade zinc powder comprising particles fabricated from a zinc alloy, said alloy consisting essentially of zinc, bismuth, indium and lead, said particles having a surface oxidation of less than 0.10 %, preferably less than about

0.06%.

55. A battery grade zinc powder comprising particles fabricated from a zinc alloy, said alloy comprising zinc and aluminum, said particles exhibiting an alkaline aluminum loss of less than about 20% when immersed in KOH electrolyte.

56. A LR-06 electrochemical cell comprising:

a positive terminal fabricated from a conductive material;

a cathode in electrical contact with said positive terminal;

an anode comprising a battery grade zinc powder as defined in claim 5, said zinc powder being suspended in a gelled electrolyte;

a separator electronically separating said cathode and said anode; and

a current collector inserted into said anode;

wherein when a load of 1 ohm is placed between said positive terminal and said current collector, a cut-off voltage of 1.0 volts is reached in a time of greater than about 34 minutes.

57. The LR-06 electrochemical cell of claim 56, wherein said cut-off voltage of 1.0 volts is reached in at least about 42 minutes.

58. A LR-06 electrochemical cell comprising:

a positive terminal fabricated from a conductive material;

a cathode in electrical contact with said positive terminal;

an anode comprising battery grade zinc powder as defined in claim 5, said zinc powder being suspended in a gelled electrolyte;

a separator electronically separating said cathode and said anode; and

a current collector inserted into said anode;

wherein when a current of 1 ampere is drawn by a load placed between said positive terminal and said current collector, a cut-off voltage of 1.0 volts is reached in a time of greater than about 36 minutes.

59. The LR-06 electrochemical cell of claim 58, wherein said cut-off voltage of 1.0 volts is reached in at least about 45 minutes.